

**Before the
Federal Communications Commission
Washington, D. C. 20554**

In the Matter of)	
)	
Review of the Emergency Alert System)	EB Docket No. 04-296
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)	

To The Commission:

**Comments of Sage Alerting Systems, Inc.
In Response To The Second Further Notice Of Proposed Rulemaking**

Introduction

1. Sage Alerting Systems, Inc. is the manufacturer of the Sage ENDEC and the Sage Digital ENDEC, Part 11 certified EAS encoder/decoders used by a large number of radio, TV, and cable facilities around the country. The Sage ENDEC was the first device to be Part 11 accepted in 1996 and has played an important role at the Federal, State and local level providing emergency management with reliable access to radio, TV and cable facilities.
2. The authors have worked with EAS since its first field trials, and have been involved with EAS systems at the Federal, State, and local levels, and are active in broadcaster and vendor EAS committees.
3. This same design philosophy was carried forward in the new digital EAS/CAP ENDEC enabling radio, TV and cable station operators to quickly program and originate alerts of all kinds.
4. The original Sage ENDEC, and the current CAP enabled Sage Digital ENDEC, were designed to provide a flexible interface to radio, TV and cable facilities as well as regional emergency management centers and state EOCs. One of the design criteria of the Sage ENDEC was to insure reliable operation with minimal

operator training, especially for the EAN alert. Sage ENDECs performed well in the Alaska test.

5. The FCC's Second Further Notice Of Proposed Rulemaking¹ (the Notice) asks important questions regarding the overall EAS system and the need for national testing. We agree that there is room for improvement in the system and the procedures for its use.
6. Sage applauds the Commission's plan to run a national test of the Emergency Alert System. There is no other way to substantiate the operational readiness of the system than periodically testing it in a national environment as proposed in the Notice. Sage agrees that a once a year test with pre-notification of approximately 60 days should be adequate, although an additional month may be necessary to adequately prepare stations for the first national test.
7. We will also comment on the importance of holding back a sliver of the 700 MHz Block D allocation for use as a national distribution channel for alert messages.
8. Due to the technical nature of some of the questions and answers, we provide background and discussions in our replies. Our specific recommendations are summarized near the end of this document, starting with paragraph 44.

Recommendations for National Testing

9. One of the most important observations the Commission has made in its Notice is in paragraph 17:

"...the rules generally focus on testing of components of the system rather than the system as a whole"

Sage agrees. There is room for interpretation in the rules on how to configure and use the system. Slight differences between implementations, default settings, user applied settings, and the Event and Location codes used in the alert message can and will cause problems in a nationwide test if not addressed. The recent test in Alaska, while largely successful, did point out difficulties at a system level.

¹ Second Further Notice of Proposed Rule Making, FCC 10-11, released January 14, 2010

10. Further, there is the issue of the FIPS codes. There are more States than there is room for FIPS codes in an EAS message. Unfortunately, there was no “all United States” code defined in the original EAS protocol, or in subsequent revisions to Part 11². Different assumptions on how EANs would be issued to avoid that limitation resulted in some stations not relaying the Alaska EAN test. Even so, coverage in Alaska was very good. We can and must, however, do better.
11. To get the relay rate closer to 100% for the next test, and live alerts, Sage makes the following recommendations:
- a) The FCC, in cooperation with FEMA and its other federal partners, should determine the exact combination of Event, Originator, and Location(s) to be used for the national test, and for live national alerts. This decision should take into account the necessary accommodations that must be made for the thirty-one location code limit on EAS messages³. The FCC should work with the vendor community to verify that proposed national test and live messages will have the desired effect at the system level, to have vendors verify that their equipment, both legacy and current, will respond as expected, and to verify that EAS participants can adjust their local settings to properly handle such a message. Sage believes that the Alaska test has shown that the majority of deployed equipment did respond properly to the test, and the others can be properly adjusted, in the field, before the next test. Sage believes that a reasonable combination of Event, Originator, and Location codes can be selected that will work in deployed equipment, no matter which vendor an EAS participant has selected. Some interaction with the vendor community is required. The goal is to select event coding such that EAS participants can adjust their settings without requiring a new ROM (for ROM-based legacy equipment), thereby reducing or eliminating costs to EAS participants.
 - b) The vendor community should, voluntarily, participate in a multi-vendor interoperability test. Sage recommends that a limited purpose, informal, vendor

² The original FIPS code standard, and its successors, did not provide for a All United States “00000” code.

³ The primary issue is whether or not a location code of “00000” can be used, or if a fixed location such as “Washington DC must be used for a national EAN

- led test could be run with less lead time, and at lower cost, than if it were performed formally at a national testing facility. This test would consist of a simulated environment, in particular simulating the real world multi-source daisy-chain. The intent is to test the system in a multi-vendor environment. Such a test could have found many of the system level issues that were uncovered in Alaska. It is important to attempt to verify the changes recommended after the Alaska test, and to find any other problems, before the national test is run. The vendor community contains the necessary subject matter experts to do a good job at a system level test, once tasked to do so. Also, it is important that this “pre test” be done as “no fault” as possible, so that vendors can concentrate on correction of issues rather than press releases. The end result must be a final set of procedures that will allow a national test message to be issued and processed, with the highest possible relay success rate. The pre-test could be run under the auspices of a vendor group, such as the EAS-CAP Industry Group, with the participation of the agency that would issue a national test (FEMA), and monitoring by the PEP Advisory Committee, the SBE and NAB representing broadcasters, and the FCC.
- c) The FCC should update the EAS Handbook to reflect how the EAS system works with the live EAN message and with the national test, including the role of the EAT, if any, the EOM terminating an EAN, unattended automated stations, scripts (if any), etc.
 - d) The FCC should publish the precise combination of Event, Originator, and Location(s) that it will use for the national test. This will allow users to program their EAS devices as needed. This test configuration, or a small set of configurations, such as EAN or NPT, should be used for all subsequent national testing. The lead time for the first test should be three months, and two months for the following tests.
 - e) Prior to a test, the FCC should publish a waiver on enforcement action, at least for the first test, for failure to relay the national test. This would permit important data from the test to be reported, such as “unable to program device, insufficient time to train staff, human error, improperly programmed automation interface”, etc. Most local engineering communities are prepared to help people who need

help, this “no fault” period will allow users to publicly request help without risk of censure. Penalties should apply for subsequent tests for intentional failure to address problems identified by the first test, or failure to report.

- f) The FCC should request, or require, that each EAS equipment vendor determine the exact proper settings for their equipment to relay the national test and national live alerts, and publish such information on the vendor web sites⁴. The vendor should also provide information on how to restore normal operation if an EAN message fails to terminate properly. The vendor should submit the URL to the FCC, to be placed on an FCC maintained “National EAS Test Information” page. The location of this page would then be published widely, by the FCC, NAB, SBE, trade journals, etc.
 - g) EAS participants would make the necessary settings adjustments, using the vendor-provided information.
 - h) Only then can an effective national test be run.
12. Although Sage is recommending rigorous specification of the national test, and a vendor-led pre-test, we note that the Alaska test showed that the existing system did function, in large part, as expected and desired, the problems that were encountered have simple solutions. The EAS community can do even better.

The “thirty-one locations” problem and orphaned equipment

13. As discussed elsewhere in our comments, sending a National EAN message requires procedurally working around the issue of how to alert more than 50 states and territories with a limitation of 31 locations and no national code. The best solution will need to be worked out with all participants, where “best” means:
- a) Most, if not all EAS participants can install the necessary changes, if any, through their normal “in the field” settings change capabilities.
 - b) Any remaining issues can be solved via “in the field” flash-based firmware updates, and no one needs to update ROMS.

⁴ Current vendor documentation typically gives generic examples on how to set up the EAS device to relay generic events for desired locations, but in the case of the national test, specific instructions would be a great benefit to the user community. In many cases, devices were set up thirteen years ago, possibly freshened six years ago for Amber alerts. Specific vendor supplied instructions for a national test would increase the success rate.

14. It may be possible that some orphaned hardware, from manufacturers no longer in business, will not be able to be updated to accommodate the otherwise “best” solution. The FCC should consider waiving the requirements on the stations with such orphaned equipment to participate in the national EAS test until such time as the clock starts on the new CAP requirements. Sage believes that national testing should commence on its own time line, and not be tied to CAP, because:
- a) The FCC has stated that EAS will continue to be used in the foreseeable future⁵.
 - b) The CAP rollout may not start until the end of 2010, but the first national EAS test can, and should, occur sooner.

We do recommend the waiver however, so that stations are not forced to upgrade their equipment sooner than they otherwise need to. We believe that the number of orphaned users who won’t be able to update their settings as needed will be small. We also believe that there is already sufficient equipment on the market that is both EAS and CAP compliant so that orphaned EAS participants can and should upgrade in the public interest; still, the FCC should allow stations to apply for a limited duration waiver for equipment that cannot support the national test.

Response to Questions in the Notice

The Notice, Paragraph 25. We seek comment on the specific language of our proposed rule and its sufficiency to ensure an adequate framework for the conduct of national tests implemented by this agency in collaboration with FEMA and our other Federal partners

15. The proposed rule does not specify which codes will be used for testing: *“The coded message shall utilize EAS test codes as designated by the Commission’s rules or such other EAS codes as the agencies conducting the test deem appropriate”.*

⁵“... it is likely that the existing EAS will continue to function as a critical alerting system for the foreseeable future”, the Notice, paragraph 22.

Lack of specificity in this area led to the original system level problems with the EAN code. While the Part 11 rules specify a range of actions to be taken, latitude in defining defaults, various solutions for the 31 location problem, and other issues, left room for system level inconsistencies. To allow vendors to properly explain to users what they need to do to prepare, the exact format of the test is needed. Rather than an open ended “as deemed appropriate”, the FCC should specify the code or codes to be used⁶, allowing stations to modify their settings once, and not once per test, or test agency. Use of other live code testing (other than EAN) should be discouraged, live code testing, when used at all, is more appropriate at the state level, to highlight events that are important to that area.

16. The proposed language includes “*tests will consist of the delivery by FEMA to PEP/NP stations*”, possibly leading participants to conclude that if they aren’t a PEP or NP station, the test doesn’t apply to them. We suggest:

“Such tests will consist of the delivery by FEMA to PEP/NP stations of a coded EAS message, including EAS header codes, Attention Signal, Test Script, and EOM code. All other EAS participants will then be required to relay that EAS message.”

17. We believe the 60 day warning for tests is adequate for testing, with the exception of the first test, where 90 days may be required for education and coordination.
18. We agree that stations should report the results of the test, though the FCC should specify the manner in which this will be done. While statistics should be made available to the general public, details on each test reception should not be, in this era of added attention to security. We comment further on the details of reporting, starting in paragraph 26 below.

⁶ In the early days of EAS, broadcasters were concerned about potential uses, and abuses, of the EAS system. They made it clear to Sage, at least, that they wanted the default settings to include only required alerts, allowing them to add other alert types as met with their needs. Many broadcasters, therefore, take the defaults, relaying EAN, EAT, and RMT codes. Many add Tornado Warnings or other severe weather likely for their area, some add AMBER alerts. Few add optional test codes, such as NPT, which was not required by Part 11.

19. We believe that nationwide testing should be used, as the best way to ensure that the system will perform for a live event.
20. We believe that the only way to guarantee that an EAN will work is to send an EAN as a test, at least once. The EAN is treated differently than other alerts. The two minute time limit is not used. Some vendors take other unique actions on an EAN, and some of these were a source of problems in Alaska, in particular how an EAN and EAT interact, if at all, the significance of the end of message on a EAN, and other issues⁷. In any case, an EAN is different. Sage is aware of the difficulties in using live codes in testing, not the least is the additional communication required with the general public. However, in this case, due to the unique nature of the EAN and the handling of it, at least one EAN test should be performed – AFTER a multi-vendor lab test session as recommended elsewhere in our comments. The main point of periodic testing would be to check for connectivity – between FEMA and PEP/NP stations, PEP/NP to LP/SR systems, and to local EAS participants. Once EAN operation has been checked at the system level, there should be no drift in that procedure. There will be constant drift in the readiness of the relay network as RF equipment is changed, LP stations rotate responsibilities, new PEP stations are installed, etc. Repeated connectivity testing is needed, repeated verification of EAN handling is not.
21. Sage therefore recommends only one live EAN test be performed, and that all other tests use a test code, clearly showing up in the video crawl as “test”, be used. We recommend National Periodic Test (NPT) as the code. Sage recommends that the NPT be used in the first test. This will shake out problems with the relay system in an environment where the public need not be specially informed in advance, just as they are not for regular monthly tests. The live code EAN test will need a great deal of public outreach, as was done for the Alaska test. With additional public scrutiny is the even greater requirement to get it right. A shakedown with an NPT, issued by FEMA through the PEP/NP systems and out to all EAS participants will allow problems to be addressed before the live code test.

⁷ These issues are very technical in nature, and while the details are perhaps inappropriate in a response to the Notice, but they do need to be addressed before the next live EAN.

22. Sage therefore recommends that an NPT be scheduled first, this year, with a live code EAN to run later, after a suitable time for corrections to the State and Local area relay systems. The delay between the NPT and the live EAN does not need to be an entire year, though testing thereafter should be on a yearly basis⁸.

The Notice, Paragraph 26. We also propose implementing the national test on a yearly basis.

23. Sage agrees. National testing, in lieu of monthly test for that month, would not add to the broadcasters burden of on air test time. There will potential problems with scheduling tests to avoid state/local events, severe weather or other local emergencies, etc., but the benefits of testing the system on a regular basis are obvious.

The Notice, Paragraph 27. We seek comment on the sufficiency of a two-month notice period.

24. As stated elsewhere in our comments, the first such test may require a little more notice. The first live EAN, if used for testing, will require additional notice for all concerned.

The Notice, Paragraph 28. Accordingly, we propose that the annual national test would replace the required monthly test for the month in which it occurs

25. We agree. The national test should not add to the testing burden, but simply replace one of the local test slots.

The Notice, Paragraph 29. Record collection.

26. We agree with the need for record collection, with the following concerns. The FCC should be sensitive to the “self incrimination” aspect of such data collection. The quality of data received will be much better if participants are not worried that a submission of a failure report will come with a \$8000 NAL as encouragement to do better next time. Repeated failure to submit a report should result in a fine. Repeated failures based on lack of equipment, failure to install it

⁸ An additional EAN test, once CAP is fully deployed, is also needed, and Sage will recommend this in a future CAP proceeding.

properly, etc., should result in a fine. Failures to relay, accompanied by a report on the problem encountered and actions taken, should result in a fine of only the most determined repeat offenders. The FCC's commendable action in the matter KWVE⁹ shows that the commission does take special circumstances into account. Sage believes that the FCC should include comments in its ruling that the national test report will not be used as enforcement data, except for failure to report, and repeated or intentional violations.

27. The FCC should provide information on the manner of this data collection, provide a web page describing the process, and provide an online system for filing, including a way to receive the data as an emailed form.

The Notice, Paragraph 30. Thirty days, publically available

28. Thirty days is sufficient, provided an electronic method of filing is provided.
29. Sage does not believe that the raw data should be made available to the public. Monitoring assignments are now typically not available to the general public, but could be derived from the raw data. Failure data and analysis is more likely to be complete if the station knows that the data won't be made public. Finally, equipment types installed at various locations is marketing data that a vendor would love to have on their competitors, and hate to have known about themselves.
30. The raw data should be made available to emergency planners and other authorities, but should be marked confidential and not be made public. Data in the aggregate should be made available, such as total number of stations reporting, successes, and failures.

The Notice, Paragraph 32. EAN handing

31. There are several issues with handling EAN events. It is not the role of Sage to point out the issues in other vendor's implementations. We will say that, in every case we know of where a different interpretation of the rules, or a different assumption about how a EAN would be coded resulted in a failure to relay, or other

⁹ Calvary Chapel of Costa Mesa, Inc. FM Radio Station KWVE, EB-09-SE-137

handling issue, the vendor in question acted quickly and responsibly to identify the issue and work on a resolution.

32. It is not so much a different interpretation of the rules as a different interpretation of the procedures. The protocol rules in part 11 are better defined than the procedures. Some of the procedures were left to the handbook, which has gone through several revisions since the inception of EAS. It is these procedures, and the specific coding of the message (combination of Event, Originator, and Locations) that was unexpected by some vendors, or by the settings that users selected, and that caused many of the problems. We address these issues below.

The Notice, Paragraph 32, "... breaks in the EAS chain"

33. If a device expects to see a particular location code in an EAN, and that code is not present, then that device will not relay that alert. This is not a failure of the device to comply with Part 11, but it does keep the system from relaying an EAN to all users.
34. In the case of the Sage ENDECs (both original and the EAS/CAP Sage Digital ENDEC), we do treat the EAN as a "wildcard" location. This was our solution to the thirty-one location limitation of EAS. Since the procedures for use of EAN implied that all EANs are national, it seemed an adequate solution, and did lead to the high success rate in relay of EANs by Sage ENDECs any time a live EAN has been issued.
35. We draw a distinction here between "settings" changes, which can be applied by users in the field using their normal front panel or other settings change methods, and "software change", which requires a ROM update in legacy devices, and a software download for newer systems. The FCC should seek a solution to this system problem that does not require a ROM change by thousands of legacy users. It may also be that use of an existing FIPS code, for example, Washington DC, might be best used in the EAN and national test messages. This could be added to the settings of those devices that need a particular code, and don't support an "all US" code.

36. We don't believe that it would be appropriate at this time to add a hard requirement for a national FIPS code to EAS. Many of the installed legacy devices, dating back to 1996, are ROM based, and a software change would be painful at the national level. It may be possible to send an EAN with a 00000 location code, and still have legacy devices "do the right thing". Multivendor testing is required, as we recommend in our general remarks. To reduce the cost, in possible software updates and in the time it would take stations to install them, we believe that the FCC and the vendor community should work together to determine the best engineering change to the system, the smallest change at the smallest number of user locations.
37. Multivendor testing and verification of a national testing procedure would be a non-regulatory action, hopefully voluntarily supported by all existing vendors. Sage would certainly participate.
38. We don't think any additional regulatory action beyond that proposed in the Notice would be required to force implementation of the change by the user community. The proposed amendment to 11.61(a)(3) would require stations to relay the new national test. That would require them to implement the settings changes. The proposal Sage makes here, that the FCC ask vendors to post the instructions needed by their users on the vendor and FCC web sites, would make it possible for users to easily comply with the modification of Part 11 proposed by the Notice.

The Notice, Paragraph 32, "Accordingly, they transmit the message whether or not an EAN contains a FIPS code"

39. This line has caused some discussion in the vendor community. It should have said "... whether or not an EAN contains a particular FIPS code". All EAS messages, to comply with Part 11, must contain at least one FIPS code, sending a message with no FIPS codes would result in the message being ignored.

Use of the term ENDEC

40. Sage Alerting Systems was the first to use the term ENDEC to refer to an EAS receiver. It is not a particularly common engineering term of art, a popular search engine shows 130,000 hits for ENDEC and 28,000,000 hits for CODEC.

Because of its long standing and popularity in the industry, to most EAS users ENDEC, Endec, or endec means the Sage ENDEC. To avoid confusion, the FCC (and GAO) should use the generic term EAS Encoder or EAS Decoder rather than ENDEC, in any of its forms, when referring to generic EAS devices.

How Does the EAN Message Get to Mass Media Facilities?

41. The Notice describes several mechanisms by which the EAN message will be delivered including the use of PEP stations, IPAWS when it is implemented, and generally speaking, the existing daisy chain of LP1/LP2 stations being monitored by participating mass media facilities. The Commission also addresses the concerns and vulnerability of a single point of failure in the EAN delivery method.
42. Sage Alerting Systems, Inc., the Society of Broadcast Engineers (SBE) and others have filed notices and comments with the Commission regarding the development of a 700 MHz backbone network for EAS in the United States. As the Commission well knows, the “D” block of 700 MHz spectrum has yet to be successfully auctioned off. What Sage and others propose is that the Commission carve out approximately 100 kHz of spectrum at the lowest end of the D block and 100 kHz of spectrum at the highest end of the D block and allocate it exclusively for EAS use around the country. We believe that states, broadcast organizations, emergency management and others will quickly build on these clear frequencies as a backbone to deliver CAP messages linking state and regional EOCs to radio, TV and cable facilities around the country. The same 700 MHz network could provide a reliable alternate path for the presidential EAN message and other national priority messages which must be delivered without delay.
43. As stated before, Sage and other interested parties on this 700 MHz proposal do not believe that it will negatively impact the Commission’s ability to auction off the D block in the future. In fact, the D block is designated as a public safety network built in concert with commercial entities. Using these 2 slivers of 700 MHz spectrum for local, regional, statewide and national emergency messages is very much in keeping with the spirit and intent of the D block spectrum.

Summary of Recommendations

44. Our major recommendations:

- A list of several steps to be performed prior to the start of national testing, including selection of a specific set of test alert formats, a pre-test, handbook update, limits to enforcement actions on the first national test, and central location for information on changing EAS equipment settings required for the test. See paragraph 11.
- The “pre-test”, to be performed prior to the national test, not be performed by a national testing lab. To reduce lead time and costs, the test should be vendor-led. See paragraph 11 b).
- The national test should normally be an NPT event code, to verify equipment and connectivity, with a live EAN test run only once, probably as the second national test, to verify the changes made as a result of the Alaska test and the pre-test. See paragraph 21 and 22.
- Access to raw national test data should be limited, with summary data only available to the public. See paragraph 29.
- A national location code not be added, or not be used, until a vendor review is held to determine the best way solve the “thirty-one location limitation” taking into account the large number of ROM based legacy devices. See paragraph 36.

Conclusion

45. Sage Alerting Systems, Inc. agrees with the need for yearly testing of the EAS system. The live code EAN should be tested only once to verify the system level handling of the special nature of the EAN. The normal testing, to exercise connectivity of the relay system from the President out to every EAS participant can be accomplished by mandating that Commission licensees who are EAS participants relay the NPT test code, and to report results to verify that messages were received and relayed as required. These tests will highlight any deficiencies in the network topology as well as any equipment deficiencies and will provide the commission

with hard evidence of the effectiveness of the EAS Network. A live EAN would be used again once CAP has been fully deployed.

46. Sage believes that the FCC should work with its federal partners and the EAS vendor community to perform a simple, multivendor simulated EAN test in the lab before the next national test, to make sure what was learned in the Alaska test has been assimilated, and to find any other system level issues. This test can be done simply, inexpensively, without the complexities and lead time of a national lab certification test.
47. Sage and others also believe that in order to avoid a single point of failure and other potential disruptions to the EAS network, the Commission should allocate slivers of the D block 700 MHz spectrum exclusively for EAS use by state, county and local emergency management agencies and broadcasters and cable operators as a backbone network for receiving, EAN, messages and other originated emergency communications such as a governor's message, Amber alert, NWS alerts, etc. The Commission should quickly allocate these frequencies prior to auctioning off the D block and quickly allow emergency management and the mass media community to build out their own backbone 700 MHz networks to distribute emergency alerts and CAP messages in the future.

Respectfully submitted:

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